DOCUMENT RESUME

ED 029 751 RE 001 712

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Pub Date Apr 68

Note-15p.: Paper presented at International Reading Association conference, Boston, April 24-27, 1968

EDRS Price MF-$0.25 HC-$0.85

Descriptors-*Critical Reading, *Critical Thinking, Habit Formation, Language Skills, Literary Analysis, Logical Thinking, *Reading Instruction, *Student Attitudes, Thought Processes

An explanation of critical thinking and methods for fostering critical thinking through reading are presented. Critical thinking is defined (1) as the habit of examining and weighing an idea or a thing before accepting or rejecting it and (2) as a three-factor ability consisting of attitudes, function, and knowledge. Reading is seen as an effective vehicle for influencing critical thinking abilities through the enrichment and extension of concepts and through the facilitation of the use of language. The paper concludes that critical thinking can be fostered through reading if: (1) planned instruction in the essential knowledge and skill areas is provided; (2) materials are selected to teach specific knowledge skills; (3) teaching is planned to broaden the scope and raise the level of pupil's thinking; (4) students, while reading, are induced to actively engage in thinking about the communication; and (5) students have breadth of experience and opportunities to exchange ideas and beliefs in a nonthreatening classroom. (RT)

IRA april 1968

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DEVELOPING CRITICAL THINKING SKILLS THROUGH READING

Sequence: Reading for the Gifted

A sixth grade teacher followed a suggestion made by the editors of a weekly newspaper read regularly in her classroom, and asked her above-average pupils to pretend that they were members of a commission appointed by the president of the United States to investigate the riots in Detroit in the summer of 1967 and describe in writing how they would begin their investigation. The pupils were knowledgeable of the riots and most of them were good readers and competent writers; so, they set about their task with more than the usual amount of zest. Later analysis of their papers revealed, however, that only five out of twenty-two pupils even vaguely responded to the assignment by telling how they would proceed to "investigate" the Detroit riots. More than two-thirds of the pupils wrote opinion-filled papers expressing their foregone conclusions about the cause of the riots and some went further and told how such strife might be suppressed in the future. Papers were fraught with pat answers and stereotyped expressions

typical of those frequently uttered by adults. These children, who had experienced better-than-average education for six years, had not learned to use the thinking processes that are essential to attacking a problem. Their quick response to a perplexing situation was to take action immediately toward its solution, indiscriminately utilizing the knowledge they had at hand. The thinking processes of analysis, categorizing, seeking all relevant information, and organizing or planning were not employed. These children, though able learners, were unable to shape a problem. Critical thinkers, as described by Edgar Dale, are persons who are "problem framers as well as problem solvers."

Why did the pupils respond the way they did--by parroting the ideas of others and offering simple solutions to complex problems? Was it because they were too immature to take a more insightful approach? Were they following the posture of a society which appears to be so eager for action, that superficial remedies are satisfying? Or had they been deprived of systematic instruction in the intellectual processes necessary for problem-solving during their early school years?

Raths and associates have proposed in Teaching for Thinking that the school has neglected to teach thinking skills for a number of reasons which range from teachers' inability to teach and evaluate achievement of these skills to a condition in which the school has taken on the coloration of a society which has a general disdain for intellectual processes.* Yet, at the verbal level almost every thoughtful citizen concurs with the Educational Policies Commission's statement of 1961, that the central purpose of education is to teach people to think! Piaget, has differentiated

*Louis E. Raths, Selma Wassermann, Arthur Jonas, and Arnold M. Rothstein, Teaching for Thinking, Theory and Application. Columbus, Ohio: Charles E. Merrill Company, 1967, p. 5.

this goal of education in two major categories: "The principal goal of education is to create men who are capable of doing new things, not simply of repeating what other generations have done . . . men who are creative, inventive, and discoverers. The second goal of education is to form minds which can be critical, verify, and not accept everything that is offered.* It is with this second category of thinking--critical thinking--that we are concerned here.

What is Critical Thinking?

Critical thinking is an analytical, evaluative process in which an individual makes judgments on the basis of norms of standards tha. have been developed through experience. It is characterized by a determination to accept or reject ideas, communication, or objects, after all relevant data have been secured and appropriate criteria applied. Critical thinking is not merely fault-finding and censuring; but is the habit of examining and weighing an idea or a thing before accepting or rejecting. The person who engages in critical thinking (1) exhibits an open, inquiring attitude toward experience, (2) possesses the knowledge and skills needed to fully comprehend the meanings under consideration, (3) is able to follow the organization or logic of the material, recognizing omissions and irrelevancies, (4) considers the reliability and competence of the source information, or product, and (5) suspends judgment until all essential data have been secured. Critical thinking is a three-factor ability, consisting of attitudes, function, and knowledge. Implied in the definition

*Eleanor Duckworth, Piaget Rediscovered. (Richard E. Ripple and Verne N. Rockcastle, Editors.) Ithaca, New York: Cornell University Press, 1964, p.5.

are three categories of knowledge sub-skills: Those related to semantic understandings, those that comprise logical reasoning, and those that pertain to literary analysis.*

Both knowledge and process skills interact in producing thinking ability. Benjamin Bloom describes intellectual ability as a situation in which an individual brings specific technical information and skills to bear on a problem. Bloom classifies skills as "modes of operation and generalized techniques for dealing with problems."* Applying this definition of ability to critical thinking, one must recognize the importance of certain mental processes (modes of operation) along with the three categories of specialized knowledge just mentioned. The critical thinker, apparently requires adeptness in such mental processes as, (1) observing, recognizing, and remembering, (2) interpreting, inferring, (4) analyzing, comparing, generalizing, (5) imagining, hypothesizing, theorizing, (6) applying and summarizing, and (7) synthesizing and evaluating.

Developing proficiency in critical thinking in the reading context (or print media) depends upon one's possession of sufficient background knowledge to fully understand the subject matter, but also on his ability to identify and judge the way the writer has used language, logical reasoning, or literary forms and devices to tell a story, create a mood, present information, or state an opinion.

*Helen M. Robinson "Developing Critical Readers", Dimensions of Critical Reading, Russel Stauffer, Editor, Newark, Delaware: University of Delaware, 1964, p.6.

*David H. Russell, Children's Thinking, New York: Ginn & Company, 1956, pp. 282-285

*Benjamin S. Bloom, Ed. Taxonomy of Educational Objectives: Cognitive Domain, New York: David McKay, Inc., 1956, pp. 38-39.

How can Critical Thinking be Fostered Through Reading?

Reading is a most effective vehicle for influencing critical thinking abilities. First, concepts, which form the basis of all kinds of thinking, are enriched and extended through experience provided by books, magazines, newspapers and other printed materials. Secondly, thinking operations are dependent upon one's sophistication with language, and wide reading surely helps to build language, especially vocabulary. Words perform an important function in helping one to remember and to keep processes distinct. Thinking is facilitated as the individual labels ideas and objects; thinking is controlled when words and sentence patterns assist in associating and manipulating ideas.

Knowledge of Semantics. In addition to fostering general growth in language, reading instruction can contribute to semantic understandings, which are especially applicable to critical thinking. Through analysis of both fiction and non-fiction materials, the reader becomes aware of the way speakers and writers use words to convey special meanings, influence action, or to create sensory impressions.

Early in the elementary school, children can learn that words may have more than a single meaning. All words have a primary or common meaning, but many have also, a number of meanings that vary. Box, ball, fly, set, fall, spring, and slip are examples of poly-semantic words, which young children meet in their primary grade textbooks. Encounters with such words help children to develop the concept that words have no inherent meaning, but are merely labels for the ideas of a communicator.

The maturing reader senses that the varied meanings of words may connote either favorable or unfavorable impressions. By reading advertisements and labels used by airlines and automobile manufacturers, for

example, the young reader senses the role of favorable connotations in persuading the reader. Fury, Comet, Mustang, Dart, Jet Star, Constellation, Whisper Jet give impressions of speed, strength, power, gracefulness, and even serene quiet. By contrast, words such as, clunker, flivver, tin can, and jalopy carry derogatory meanings and are used to ridicule.

Further experience with connotative powers of words may be had by noting how names of animals are metaphorized to symbolize a special quality. Lion, eagle, tiger are "good" words representing power and strength; while rat, pig, mule, vulture, convey deceit, stupidity, stubbornness, and greed.

The inadequacies and potential dangers of vague and imprecise statements can be discerned through a wide range of reading including trade books, advertisements, social studies textbooks, and political speeches. While reading a book such as Udrey's, A Tree is Nice, children can see that stating that a "tree is nice" does not adequately describe its special qualities of providing shade, fruit, shelter for play, and support for a tree house.

Noting vague expressions or "glittering generalities" in advertisements will alert the reader to be aware that words are at work. A bicycle ad reads: "Buy this fantastic bicycle with a glowing-hydrogen-brazed finish and chrome frame." Although the language sounds good, conveying a favorable impression, the critical reader must separate the glittering sounds of words from their meaning and ask, "So what?"

Logical Reasoning. Beyond skillful interpretation of language, the critical thinker must be able to judge the logical reasoning in communication. This means the ability to (1) make logically correct inferences (2) detect inconsistencies amoung statements, and (3) identify common mistakes in reasoning.

Reading is an especially appropriate media for instruction in logic because the material for analysis is permanent. One can go over and over various parts to determine the reasonableness of an argument or the reliability of the major statements. A deterrent to instruction in some of the logic skills in the elementary school is the paucity of opinion and argumentative materials written for this age group. However, careful selection from materials available will permit teaching of certain aspects of inductive and deductive thinking, such as,

- determining the appropriate use of all, some, or none statements
- classifying objects in groups and subgroups,
- distinguishing fact from opinion,
- distinguishing specific facts from generalization, and
- detecting such material fallacies as the hasty generalization, unrepresentative generalization, and false analogies.

Stories in basal readers, selections in weekly newspapers, and texts in geography and history will provide examples of fact and opinion, specific fact and unsupported generalizations, false analogies, and inappropriate use of all, some, or none. For example, one middle-grade social studies book informed readers that living and working conditions of West Virginia coal miners were greatly improved; mechanization had made mines safer for workers. Did the author mean living and working conditions for all miners or some miners, or many miners?

By reading the columns and the editorials in newspapers, and the information sections in some magazines, older children have ample material for studying the reasoning tactics employed. Of course, advertisements as well as opinion articles are excellent vehicles for understanding those propaganda devices that rely on faulty reasoning, such as the testimonial, card-stacking, band wagon, and transfer techniques.

Insight into Literary Forms. The critical thinker must be able to react to a situation, an object, or piece of communication in terms of its unique form, function, or qualities. Oil painting and sculpture found in art galleries, for example, are evaluated by standards that are quite different from those applied to commercial art. Going one step further, Post-impressionist paintings are expected to have different qualities from those of the Rennaisance period and are, therefore, subjected to some very specialized criteria. Developing critical thinking in reading requires the individual to distinguish between the types of materials he is reading and to apply specialized expectations for each literary form. He reads fiction according to one set of standards, and non-fiction in terms of another. Some general criteria are applied broadly to writing; for example, a reader generally expects all non-fiction to be reliable or trustworthy. Yet, he will expect deductive reasoning and opinion to be expressed on the editorial page of the newspaper; he will not expect opinion, card-stacking, and name calling in the news reports on the front page.

Knowledge of logic and its handmaiden semantics helps in critical thinking about informational and argumentative materials; however, a different sort of knowledge is required for reading fiction. Insight into fiction, which leads to critical reaction and accompanying appreciation, is dependent upon one's ability to read beneath the surface, noting esthetic form, detecting the use of irony or sarcasm, interpreting metaphors and symbolism, and understanding the development of plot and characterization.

Many teachers who strongly advocate the critical reading of nonfiction in the elementary school resist critical examination of literary forms, components, and devices that comprise the artistic structure of fiction. They fear that the close reading or study of literature will diminish the

young readers' enjoyment and "appreciation" of the work. They fear that Wind in the Willows or Charlotte's Web will be "ruined" by close reading. But the pieces of literature, themselves, have no inherent value that must be preserved; they are of value only as they enrich the experience of the reader. I. A. Richards has stated, one does not read to understand what certain authors were thinking at a given time, but "for the sake of the things their words . . . if we understand them . . . can do for us. . . We use their words to stretch our minds."* In the same vein, Pearce defined "appreciation" in relation to literature as the appreciation of the individual. It is the reader, who in the etymological, sense becomes richer, fuller, who grows, not the literary work.*

Instruction in the critical reading of literature, which will help the reader to realize that Charlotte's Web is more than a good story about friendship in a barnyard, will pave the way for the reader to begin to "appreciate", to grow himself. He will begin to sense that a selection worth reading has not only an esthetic beauty of form, but, also, contains human values of worth. With the guidence of a skillful teacher, children begin to sense that fiction has a big idea or theme that runs beneath the plot. If the teacher plans instruction so that selections of similar themes are presented together, even primary children can realize that The Rabbit Who Wanted Red Wings, Robbut, and Dandelion have something in common: each character was dissatisfied with himself.

Children become aware of the author's devices used to create and interesting story as they identify foreshadowing and symbolism used effectively. Primary children are alerted to forthcoming catastrophy in Ezra Jack Keats'

*I. A. Richards, How to Read a Page. Boston: Beacon Press, 1965, p. 16.

*Ray Harvey Pearce, New Directions in Elementary English. (Alexander Frazier, Editor.) Champaign, Illinois, 1967, p. 45.

The Snowy Day and will predict that something surprising and disappointing will happen when Peter puts the snowball in his pocket. When guided to read at a deeper level, children note the security-of-home symbolism of the willow plate in Blue Willow; likewise the fear, harshness, and punishment symbolized by the broom in Hurry Home, Candy.

Instruction to the critical reading of fiction will enable children and youth to discern that all of the arts have a form, express man's moods and concerns in a new unique way, symbolize ideas not explicitly expressed, and may be interpreted at varying levels of insight. Furthermore, reading fiction critically will not only help children develop personal criteria for judging forms of communication, it will help them to develop the habit of consciously seeking meaning and applying standards.

Skill in the Thinking Processes

Thus far, this paper has emphasized the role of specialized knowledge in critical thinking. However, the critical thinker must have attained skill, in utilizing a variety of mental processes, also. Generally, educators--supported somewhat by the early work of Piaget--have assumed that differentiation in thinking processes was a result of maturation. Recent research in thinking conducted by Raths and associates, Taba and colleagues, and the investigation of the critical reading behaviors of elementary school children conducted at Ohio State University indicate that thinking processes can be influenced, both in variety and level, by planned instruction. Taba studied the thinking processes of children in social studies subject-matter, with the original intent of sequencing learning experiences so that the content would be presented developmentally. Using teaching strategies to guide children's thinking processes was a

subsidiary goal. During the progress of the study the investigators report, teaching strategies assumed much greater significance because they appeared to "have strong effect both on the scope and the level of thinking in the classroom." Later, these researchers concluded that the nature of the questions that the teacher asked "has a singular impact on the progression of thought in the classroom . . . Questions are the carriers of whatever new cognitive system is emerging."*

Corroborating the Taba study are the results of the Ohio State Study of Critical Reading of Elementary School Children which revealed that the kinds of questions teachers asked were significantly related to the level of thinking that children generated. Teachers who concentrated on questions that required only literal repetion of material read, received random and memory-type responses; those who asked children to analyze--compare, contrast, relate one part to the whole or the whole to another element--elicited higher level responses. Children categorized, generalized, hypothesized, theorized, and evaluated when they were prodded to do so!

The teaching strategy is to pose questions according to the particular reading content that the teacher wishes to emphasize and to frame questions that call for several types of thinking. If the teacher wants to guide pupils' growth in the "ability to judge the authenticity of materials," she will select suitable materials, first. Two or more biographies of a selected individual, such as Abraham Lincoln or John F. Kennedy may be chosen. Her questioning relative to the Kennedy sources might go something like this:

*Hilda Taba, et al, Thinking in the Elementary School. Cooperative research Project No. 1574, San Francisco State College, p. 177.

What does each book (author, source) tell you about John Kennedy?
Which are facts? Which statements are opinions?
How are the fact supported? Are the opinions supported?

How can we determine whether or not the statements in one source are reliable?

Do the writers of Biography A agree with those of Biography B and C?
On all of the statements? On some of the statements?

In what other ways do the biographers differ?

How can we determine which biographer is most accurate?

From the three biographies, what can we conclude about John Kennedy's life? What sort of person was he? What influenced his life?

Which biography did you enjoy reading most? Why?

Who were the authors of the three biographies? Can you identify some reasons why one person wrote a more detailed, accurate, and interesting birography than the other two?

What do you expect from a "good" biography?

In this sequence of questioning, the teacher is guiding the pupils to examine the structure of biography and the elements important to consider in determining authenticity, but she is also, eliciting a variety of responses. First, at the literal or memory level, pupils are asked to indicate what the various sources stated; next, to separate the facts from opinions. As they searched for support for opinions and documentation of facts, students were engaged in a type of inferring thinking in which they were seeking relationships between elements. Comparative thinking was required as the three sources were scrutinized for likenesses and differences, and generalizing was called for as students made general conclusions from the three biographies. When the teacher asked the children about the three writers and why they liked one source better than the others, she was seeking evaluative thinking that was based upon standards. In the last question,

she was seeking synthesis, as she asked that the pupils propose criteria that could be applied to all biographies. The teaching strategy seeks to help pupils identify important facts, opinions, and generalizations; to discriminate between relevant and irrelevant statements and possible omissions; to compare different sources and determine new generalization; and finally to judge the information against established criteria. Ultimately, the teacher's purpose is to foster certain habits of thinking.

Habits and Attitudes

Careful attention to teaching certain knowledge and skills, alone, will not assure the production of critical thinkers. Permeating the entire process serving as facilitators or detractors, are the habits and attitudes one holds toward experience. Crucial to critical thinking in reading is the habit one establishes toward printed materials. A person may approach with absorption, accepting all or much of the author's message; or he may actively engage in the communication process through questioning, imagining, and valuing. If we are to develop readers of this latter type, instruction must be started early. Habits and attitudes are formed early and become increasingly difficult to change as one matures. The individual's initial contact with reading partially determines the way he will respond to printed materials later. Teachers of beginning readers can guide children toward active engagement in the reading-thinking process or they can let them slip into a passive acceptance of everything they read. A stance of skipticism toward reading is well worth the effort of cultivation, even in the first grade.

Although there is ample research data to show the influence of habits and attitudes on critical thinking, there is little evidenc to show that

reading will change attitudes. However, a range of experience is available to man through books and other printed materials. It seems reasonable to conclude, then, that adequate and appropriate exposure to this wealth of experience should make some impact on attitudes, if attitudes can indeed by changed by vicarious experience.

Using college freshmen as subjects, Kemp investigated the influence of reading and teaching methods on open/closed-mindedness. He concluded that improvement in critical thinking can be achieved, if favorable learning conditions are provided. Favorable conditions according to Kemp, consist of (1) small group situations, where members feel safe and free from threat, (2) intensive instruction is given to the factors involved in critical thinking, and (3) extensive practice in problem-solving is given. The reading group of the typical elementary school classroom could provide the safe unthreatening situation. All that may be needed to foster attitudes of openness, then, are the added factors of reading materials, both fiction and factual, that center about important or controversial topics; guidance in the processes of thinking; and maintenance of as much permissiveness as the students demonstrate they can use.

Conclusions

Children spend from one-sixth to one-fourth of their school day in reading instructional activities. If critical thinking is to be taught, it appears to be esential that the reading avenue be utilized. It has been proposed in this paper that the critical thinking can be fostered through reading, providing that:

(1) Planned instruction in the essential knowledge and skill areas is provided;

(2) Materials are selcted or designed to teach specific knowledge skills;

(3) Teaching strategies are planned to broaden the scope and to raise the level of the pupils' thinking;

(4) Students are inducted into the reading process in such a way that they will actively engage in thinking about the communication; and

(5) Students have breadth of experience and the opportunities to exchange ideas and beliefs in a secure, non-threatening classroom.